



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Practice Test
Support Materials
2008**

**Grade 8
Science**

**NECAP SCIENCE 2008 PRACTICE TEST
GRADE 8 SUPPORT MATERIALS**

Grade 8 Science Practice Test Item Information

Practice Test Item Number	1	2	3	4	5	6	7	8	9	10
Big Idea ¹	POC	INQ	MAS	POC	POC	NOS	SAE	INQ	INQ	POC
Assessment Target	PS1.1	PS3.8	PS1.5	ESS1.3	ESS1.5	ESS2.7	LS2.6	LS4.11	LS2.5	ESS1.3
Depth of Knowledge Code	1	2	2	2	2	1	1	2	2	2
Item Type ²	MC	MC	MC	MC	MC	MC	MC	MC	MC	CR
Answer Key	D	D	A	C	B	A	C	B	B	
Total Possible Points	1	1	1	1	1	1	1	1	1	4

¹Big Idea: NOS = Nature of Science, SAE = Systems and Energy, MAS = Models and Scale, POC = Patterns of Change,
FAF = Form and Function, INQ = Scientific Inquiry

²Item Type: MC = Multiple Choice, CR = Constructed Response

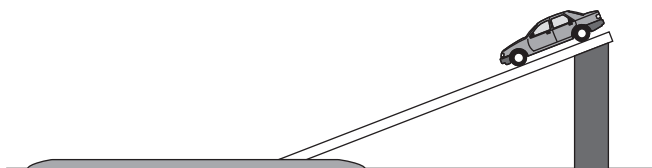
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PS1.1 (5–8) POC Students will investigate the relationships among mass, volume, and density.

- ❶ For a given substance, which statement is correct?
- A. Density increases as volume increases.
 - B. Density increases as mass increases.
 - C. Density is not related to mass or volume.
 - D. Density remains constant as volume and mass change.

PS3.8 (5–8) INQ Students will use data to determine or predict the overall net effect of multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects.

- ❷ A student sets up the experiment shown below to investigate how friction affects the motion of a toy car.



The student releases the car down the ramp and measures how far the car travels. Which variable **must** the student change to test how friction affects the motion of the car?

- A. the height of the ramp
- B. the length of the ramp
- C. the position of the car on the ramp
- D. the surface at the bottom of the ramp

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PS1.5 (5–8) MAS Students will, given graphic or written information, classify matter as atom/molecule or element/compound (not the structure of an atom).

3 Which molecule represents an element?

- A. bromine gas (Br_2)
- B. carbon dioxide (CO_2)
- C. hydrogen fluoride (HF)
- D. sodium chloride (NaCl)

ESS1.3 (5–8) POC Students will explain how Earth events (abruptly and over time) can bring about changes in Earth's surface: landforms, ocean floor, rock features, or climate.

4 Some scientific studies indicate that Earth's average temperature has increased 0.6°C in the past 100 years.

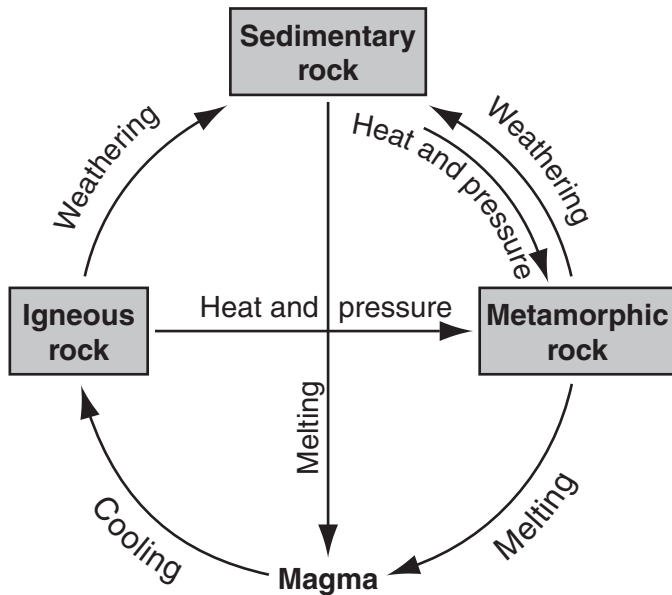
What will be the **most likely** effect of the change in temperature?

- A. increased landmasses
- B. increased earthquakes
- C. increased glacial melting
- D. increased volcanic activity

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ESS1.5 (5–8) POC Students will, using data about a rock’s physical characteristics, make and support an inference about the rock’s history and connection to rock cycle.

- 5 The diagram below shows the rock cycle.



Which conclusion is **best** supported by this diagram?

- A. All rocks are made of minerals.
- B. All rocks can change into other types of rocks.
- C. Igneous rocks are formed from heat and pressure.
- D. The formation of sedimentary rocks involves heat and pressure.

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ESS2.7 (5–8) NOS Students will explain how technological advances have allowed scientists to re-evaluate or extend existing ideas about the solar system.

- 6** In the 1600s, Galileo used a telescope to make scientific observations of the night sky. How did this use of technology improve our understanding of the solar system?
- A. by allowing closer examination of the Moon's surface
 - B. by helping scientists accurately calculate the distance between galaxies
 - C. by helping scientists name the planets in the solar system
 - D. by providing new evidence to support the Big Bang Theory

LS2.6 (5–8) SAE Students will, given a scenario, trace the flow of energy through an ecosystem, beginning with the Sun, through organisms in the food web, and into the environment (includes photosynthesis and respiration).

- 7** How does a plant use energy from the Sun?
- A. to obtain heat from the soil through its roots
 - B. to produce sugar molecules in its roots
 - C. to produce sugar molecules in its leaves
 - D. to obtain heat from the surface of its leaves to break down sugar molecules

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LS4.11 (5–8) INQ Students will, using data provided, select evidence that supports the concept that genetic information is passed on from both parents to offspring.

- 8 A student hypothesizes that tall parents produce tall offspring. In addition to the heights of the tall parents and the offspring, which other information does the student need to support his hypothesis?
- A. the number of offspring produced
 - B. the ages of the offspring when their heights are measured
 - C. the time of year when the offspring's heights are measured
 - D. the weights of the offspring when their heights are measured

LS2.5 (5–8) INQ Students will, using data and observations, predict outcomes when abiotic/biotic factors are changed in an ecosystem.

- 9 The table below shows how different water temperatures affect the annual number of eggs one type of fish produces.

Effects of Water Temperature on Annual Reproduction of One Type of Fish

Water Temperature (°C)	Percent of Females That Produced Eggs	Number of Times Females Deposited Eggs	Total Number of Eggs Produced
8	100	23	599,000
10	100	17	323,000
12	67	3	26,000

Which statement predicts the effect warmer water temperatures would **most likely** have on this type of fish?

- A. The fish would quickly adjust to the new temperatures.
- B. The fish population would decline over time.
- C. The fish would lay eggs more often to produce enough eggs.
- D. The fish population would produce more females than males.

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ESS1.3 (5–8) POC Students will explain how Earth events (abruptly and over time) can bring about changes in Earth’s surface: landforms, ocean floor, rock features, or climate.

- 10** Weathering and erosion are processes that change features on Earth’s surface.
- Identify **one** type of weathering and **one** type of erosion that occur in New England.
 - Explain how the types of weathering and erosion you identified in part (a) change land features.

Scoring Guide

Score	Description
4	Response demonstrates a thorough understanding of how Earth events such as erosion can bring about changes in Earth’s surface. Student identifies one type of weathering and one type of erosion and explains how the land is affected by each type. The response has no errors or omissions.
3	Response demonstrates a general understanding of how Earth events such as erosion can bring about changes in Earth’s surface. The response has an error or omission.
2	Response demonstrates a limited understanding of how Earth events such as erosion can bring about changes in Earth’s surface. The response has errors and omissions.
1	Response demonstrates a minimal understanding of how Earth events such as erosion can bring about changes in Earth’s surface. The response has several errors and omissions.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

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Training Notes:

The correct types and changes expected are listed below.

Erosion

1. Glaciers scrape out large sections of the land. They are heavy and can carry large rocks and other materials over long distances. Glaciers scratch Earth's surface as they move. Glaciers can deposit material in areas far from where the glaciers began moving. Glaciers may carve and deposit many sediments.
2. Wind can pick up fine particles of soil where few plants grow. Moving the soil can make it less fertile for farming. Over time, all of the soil layers could be moved by wind.
3. Running water has the power to move large and small particles of material. It moves from higher to lower areas. Running water creates streams as it moves.
4. Coastal waves erode the coast of land areas. They can carve out cliffs, arches, and other features along the edge of the land and change the shape of the shoreline. Sand particles are picked up, moved, and deposited in other areas to make sandbars and barrier islands.
5. Gravity affects the other types of erosion. For example, glaciers move downhill, and water flows downhill. Because of gravity, mudflows and landslides can occur.
6. Deposition: Floods can deposit sediments in low-lying areas as rivers overflow their banks, creating flood plains.

Weathering

7. Mechanical weathering:
 - The constant heating and cooling on the surface causes rocks to crack and crumble into small pieces.
 - The freezing of water in the cracks of the rocks breaks them down into smaller pieces.
 - Gravity causes rocks to fall.
 - Plant roots growing in the cracks of rocks can expand and break the rocks into smaller pieces.
 - Abrasion: Wind or water (particles carried by wind or water) wears down rock or soil.
8. Chemical weathering:
 - Acid rain dissolves limestone.
 - Caverns are formed when certain minerals preferentially dissolve in underground water.

SCORE POINT 4

10

A - One type of weathering freezing and thawing, if you have a rock with a crack in it and it rains water will get in the crack and freeze making the crack bigger, then it melts and when it rains it fills up with water and freezes which makes the crack bigger. One type of erosion is flooding.

B - Freezing and thawing can break apart rocks because when water freezes it expands and makes the cracks bigger. Flooding picks up sediments from one place and deposits them in another place forming sand piles or a bend in a river.

The response is complete and includes all required elements. The response correctly identifies freezing and thawing as one type of weathering and flooding as one type of erosion. The process of rainwater falling into cracks in rocks, freezing, expanding the size of the crack, and then melting is thoroughly addressed between parts (a) and (b). The response states that this process can "break apart rocks," which clearly demonstrates a change in land features. The description of how flooding transports and deposits sediments is accurate, and the response provides specific examples of how land features could be changed by the process.

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SCORE POINT 3

10

a. One type of weathering in New England is when rocks, such as the cliff things on the highway, get wet from the rain and then have the water freeze. When the water freezes it expands, causing cracks to form on the rocks.

One type of erosion is on the beaches. The ocean water breaks down the rocks, causing sand to be made.

b. The types of weathering and erosion I identified change land features by cracking them, making them smooth, and wearing them down.

The response shows a general understanding of the concepts addressed. The response correctly describes how rainwater enters cracks in rocks and expands the cracks as it freezes. However, the response does not address the process of breaking the rocks along the cracks. The discussion of beach erosion is general. Additionally, the response does not mention that erosion involves the transportation of materials. The response provides a correct description of how weathering and erosion crack, smooth, and wear down land features; however, no details or specifics are provided.

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SCORE POINT 2

10

One type of weathering that takes place in New England is when the snow builds up on the mountains. A type of erosion is when the snow melts and runs down the mountain.

It changes land features because it erodes the materials and places them in different areas.

The response shows a limited understanding of the concepts addressed. The response correctly identifies one type of erosion as snow melting and running down the mountain. The response also correctly explains that erosion causes the movement of materials from one location to another, implying a change in land features, but it does not specifically address what land features would change. The description of snow building up on the mountains as a type of weathering is incorrect, as snow and snow accumulation relate to weather, not to the geologic process of weathering.

SCORE POINT 1

10

weathering - trees rotting
erosion - rocks becoming smaller, smoother

The response shows a minimal understanding of the concepts addressed. The response states "rocks becoming smaller [and] smoother" but does not identify a specific erosion process (e.g., running water, glacial advance) that could be responsible for the change. A "rotting tree" is not a valid response for a type of weathering.

SCORE POINT 0

10

a.) Snow and earthquakes

b.) Snow Changes New England in a way of appearance the ground is covers with white blankets of crystalized water. Earthquakes change New England in a Terrible way Trenches Split the earth cracks in the roads buildings get destroyed

The response shows no understanding of the concepts addressed. While the response does refer to changes in the appearance of land, the changes described are not relevant to the processes of weathering and erosion.